

VIDEOTEK AVAILABILITY TO USERS

Report to the Canadian Videotex Consultative Committee (CVCC)

Subcommittee on the Individual and Society and to the  
Department of Communications

DSS No. 09SV. 36100-0-0845

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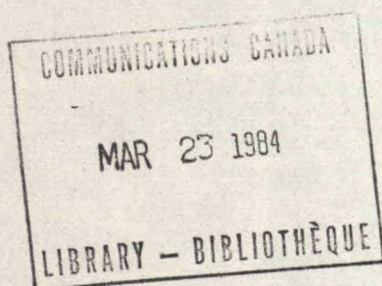
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*Promise them anything but give them a propaedeutic scenario.*

— Bruce Mazlish

## 1. TRIBESMEN IN THE GLOBAL VILLAGE

*(Can't you hear those distant drumbeats?)*

*The poor ye always have with you.*  
— St. John, xii.5

Gutenberg Two, the pundits call it. The coming information revolution. Wired City, Wired World. The huge, slow-witted computational devices of twenty-five years ago have evolved. Their myriad vacuum tubes have been replaced by integrated circuitry on silicon chips, and the electric abacuses have become the electronic oracle. Videotex, it is promised, will bring us all together in one vast, computer-accessed, information-wealthy, cybernetic matrix. A television of abundance. A cornucopia of intelligence.

But although the hardware exists in all its cold reality, the manner of its implementation and the nature of its entrenchment in society remain vague and only dully anticipated. So, as the future looms, mixed with the quickening excitement there is a burgeoning nervousness. Dian Cohen's statements in In Search (1980) are indicative of the paradoxical sentiments with which the encroaching technology is being received:

Dramatic implications for our way of life arise from the meshing of computer technology and information transmission. It is conceivable that the evolution from an industrial to an information-based society will produce nothing but new opportunities for material well-being and spiritual fulfillment . . . It is also possible that the information revolution



will be an unmitigated disaster -- destroying whole industries that will no longer be competitive; decimating jobs; rendering skills obsolete; causing privacy problems, since social insurance numbers might be linked to bank and credit records, medical records and job experience; even affecting the international flow of goods and services. (p. 6)

There is also the escalating suspicion that the mere existence of the new technology will erode the efficacy of traditional channels of acquiring information, and that eventually these rote and familiar channels will be displaced -- perhaps even disposed of. In the process, it is feared, the new machinery will play havoc with established norms and strategies for functioning in society, warping some while condemning others to irrevocable obsolescence.

Certainly the capability to negotiate matters of finance, of commerce, education, health service, correspondence, science, culture, and entertainment via sophisticated computer/communications devices will constitute, ultimately, an enormous boon, but the attendant wrenching revolution also harbours the potential for monstrous disruption and damage. As Anthony Smith realized in The Politics of Information:

We still have to discover how to fit these and future inventions into future society . . . and how to overcome the problems of transition. In many cases, these social problems of transition and organization are far more intractable than the primary technological invention of the new devices themselves. (p. 228)

Chief among the potential problems of transition is the concern that, as the technology is deployed, unequal distribution may result in the creation of a privileged minority with enhanced access to a whole spectrum of information, and who will capitalize on this access to the detriment of the less-privileged. Herbert Goldhamer of the RAND Corporation articulated such worries in an article issued eleven years ago:

. . . the home devices of the future, especially audio-visual two-way communication with home computer consoles and print-out terminals, will initially be the playthings, the status symbols, and finally the useful home appliances of the well-to-do. If having these devices in the home confers, as some believe, a marked educational, cultural, or economic benefit, then an interim advantage to the well-to-do will thereby ensue. (Goldhamer; 949)

The immediate answer to such concerns is a strident cry for equity of access -- a brandished slogan that presupposes that ensured widespread availability of the technology will circumvent the creation of an information elite.

However, things in this tangled, technocratic world are rarely that simple. As long ago as 1940, Lazarsfeld, Berelson, and Gaudet adumbrated the two-step model of information flow, whereby ideas moved from their source medium to so-called opinion leaders first, and from them only subsequently to the less active sections of the population. The theory of information diffusion has become markedly more sophisticated and more complex in the intervening years since the publication of that seminal work, but

it is clear that there will always be segments of society that are 'information-hungry' that can and will take the time and effort to actively seek information from the available sources, and that are intellectually equipped to capitalize on that information. "Diffusion is usually seen as a god-sent autonomous process which assures the trickle-down of income- and welfare-generating ideas and which thereby guarantees their distribution among all members of a population," observe Røling et al. (1976) ". . . But now we look not at how well diffusion processes distribute the benefits of new technology, but at how badly they often do it." (p.64)

There is, in fact, nothing inherent in mere guaranteed availability of information sources that guards against the formation of an information-wealthy elite. There will be poor always. Indeed, Guité (1977) noted that there already exists an information-rich coterie, composed of,

. . . some 15-20 percent of the population made up of more educated individuals, in higher socio-economic categories, with well-defined information-seeking habits, with a pattern of using disposable income to buy information to accomplish specific ends. (p.57)

At the same time,

. . . The information-poor include the rest of the population who have less developed information-seeking patterns, whether because they reject the information culture, are indifferent to it, or do not have adequate opportunities or abilities. (p. 58)



This is not to say that there are no conditions under which access to a videotex system, or lack of access, would become an issue to be addressed. The mere fact that certain portions of the population are more inclined to use such systems to their full advantage in no way constitutes a justification for limiting their availability to only those who are so disposed.

At this point it becomes necessary to shift the focus of considerations of equity of access away from the presumption that practical applications of such a principle will relieve the gap between the information -rich and -poor, and to emphasize how much the notion acquires meaning only in the context of what uses the system is put to and what services will be available via videotex. For example, speculates Goldhamer:

It is not clear whether a future world of time-shared computer systems will require that most individuals have a higher level of education and intelligence than today . . . but perhaps a world divided between a small elite and a multitude of relatively ignorant workers is again in the making . . . An optimistic view is that any additional sophisticated service available in the society is a gain for the individual. A pessimistic view considers the possibility that society might evolve into a situation with users on one side and system designers, producers, and manipulators on the other side. It has been said of the United States Navy Logistics System that it was a system designed by geniuses to be run by idiots. True or not, this at least succinctly states one possible form of the developer-user relationship. (Goldhamer;950)

In Goldhamer's pessimistic scenario, equity of user access becomes an empty prevarication. Although assured and secured, availability of the technology is a worthless concern. It has the hollow ring of the "Freedom to Listen" that was touted in an RCA radio advertisement of the early 1950s, and derided by Marshall McLuhan in The Mechanical Bride. "Come on kiddies," McLuhan urged, "Buy a radio and feel free -- to listen." For McLuhan, writing in a pre-television time, "'Freedom to Listen,' in a world where effective expression ... is reserved only for a tiny minority, is freedom to put up or shut up." (McLuhan; 21) So it may be in the coming days of the videotex terminal.

Equity of access only becomes a legitimate concern under the conditions of an optimistic scenario, whereby the service amounts to a real gain for the individual -- in the sense of profoundly affecting the quality of his or her life for the better. The scenario to be resisted is one in which the computer/communications technology offers, in addition to the expected mere novelty or labour-saving capabilities, services that are genuinely responsive to the basic social needs of the individual, but to which services, availability is selective or inequitable because of limited access to or availability of terminals. In such a situation, the information-deprived would be in the position of the primitive inhabitants of an isolated valley in New Guinea, vainly listening for crucial messages relayed by distant drumbeats, while all around them the rest of the world is benefitting from communication via unheard amplitude and

frequency modulations of waves in the electromagnetic spectrum.

(Sagan;224)

The first part of this scenario -- in which videotex systems function as fundamentally socially beneficial tools -- should be vigorously encouraged and promoted. Indeed, it should be the prime motivation for designing and implementing computer/communications networks. The technology's potential for disrupting familiar and set methods of acquiring information and performing adequately in an already complex and Heraclitean world, suggest that potential profit alone, however compelling, cannot guide videotex development. It is only within the terms of a socially profitable (as opposed to a merely financially profitable) videotex system that notions of equity of access become meaningful.

## 2. SOCIALLY RESPONSIBLE TECHNOLOGY

*(Is there a ghost in the machine? Does it have a conscience?)*

*For those whom life has cheated  
Open the electric paradise  
- Moravskaya*

The task of the research scientists and engineers is all but complete: the hardware exists. The decoders, the character generators, have all been developed, and there are no crucial physical obstacles to be surmounted before the hardware can be implemented as a Canadian videotex system. There are no major technical hurdles to overcome preventing Telidon from spewing its information and geometric images into a large number of Canadian homes and businesses.

Accompanying software, too, is in the making. In late 1979, seventy major potential information providers grouped to form the Videotex Information Providers Association of Canada (Vispac), an umbrella information industry organization composed of newspaper publishers, telephone company representatives, computer companies, federal and provincial government departments, universities and retailers.

This, then, is the present situation: videotex field trials, both public and residential are underway in several Canadian locations. In addition, the first commercial Telidon service, Project Grassroots, a joint undertaking of Infomart and Manitoba Telephone System, is providing information to Manitoba's agribusiness community. Enhanced network testing is planned for a 1982, year long field trial of iNET, a user-oriented intelligent network developed by TCTS's Computer Communications Group.



Given these current circumstances, under what conditions of foreseeable future developments would equity of availability of videotex service become an issue to be addressed?

Anthony Smith (1978) has noted:

During the last two centuries, when mankind has been increasingly occupied with the process of industrialization, we have come to associate the process of development with the idea of invention . . . Society has become dependent upon these apparent gifts and has turned them rapidly from new luxuries into essentials. (p. 227)

The immediate inclination is to insist that, while videotex may initially make its introduction purely on its merits as a novelty, it may gradually supplant traditional means of securing information to the point where those individuals without a terminal will be placed at a real disadvantage, their ability to function adequately in society severely hampered. However, while videotex may well become an important and near-compulsory tool, it is by no means apparent that this will necessarily and automatically occur if the development of the system is left to purely commercial interests.

There is nothing, of course, wrong with seeking to turn a healthy profit, but it must be remembered that sound commercial motives do not necessarily coincide with those of honest social responsibility. In fact, the pressures of the unrestrained marketplace are notoriously myopic when it comes to matters of greater social welfare, as experience has demonstrated in the history of broadcasting in Canada. It appears the broadcasting industry is structurally unlikely to comply with public policy objectives when commercial concerns alone dictate broadcasting content. (Babe 1979)

So, too, it may be with the developing videotex industry. The commercial viability of the system will be measured in terms of consumers' means and desires to pay for it. "The key . . ." Gerry Haslam, President of Vispac, has stated, "is to find those areas of content which have enough commonality among consumers to make the financial proposition of videotex an attractive one." (Haslam 1980, p. 22)

Although those areas have yet to be established firmly, it is likely that they would concentrate in the realm of convenience and entertainment services. That is, left to their own devices, business interests would mold a videotex network which would be little more than a labour saviour; an inanimate factotum that would render time-consuming or irksome activities less so, that would augment already-existing means of acquiring information and performing routine tasks, and that would be capable of

keeping its consumers amused in the bargain.

Several LINK Reports (1981) have noted the popularity of games and quizzes, hobby information, and market demand for local information demonstrated by a few market analysts. Stock exchange quotations, airport arrival and departure schedules, information of specific interest to professionals (Guité 1977) are precisely the types of information that can piggyback, and can be paid for by, advertising. The new, expanded screens would permit tele-shopping, video-banking, automatic fire and burglar reporting, remote utility reading, and would flash up-to-the-minute news, weather, sports, classified advertisements, yellow pages, real estate listings and the like.

While such commercially popular services have both an obvious appeal and an intrinsic worth, their availability is limited to those with the means and the willingness to purchase them. This inevitably leads to immense disparities in the technology's distribution throughout society. As Jacobson (1979) contends with reference to deregulation of communications in the United States and reliance on "marketplace forces" to bring about systems of communications in the national interest:

Specifications of services, distribution of services, and pricing of services are all left to the corporate community. It is impossible to conceive of all the inequities such a situation might engender. (p.34)

But, although leaving videotex to the caprices of market forces results inescapably in uneven availability of services, the disparity of access is not an issue that demands redress, or even scrutiny. Equity of access in this context is a bankrupt notion, simply because the services being offered do not extend in their social implications beyond mere convenience or blithe amusement. They may indeed make life easier for their consumers, and in that sense confer an advantage on the user, but they in no way place the individual without access at a social disadvantage. They are luxuries: comfortable services that are of no more cultural import or social significance than the microwave oven, the Cuisinart, the automatic garage door, or the digital alarm clock. Videotex in the sole hands of large commercial interests is nothing more than a household appliance, a bigger and better appliance, to be sure, but still just another appliance. "The display of cute electronic toys in the stores ..." Gordon Thompson has noted (1980, p.26), "seems to suggest that the new microchip technology is more at home in the trivial areas of our lives than in the more serious ones."

Considered in these terms, the Financial Post may well have been correct in its pronouncement that:



The personal computer will not change society or dramatically affect people's lives as some have predicted . . . No one can think of a use for the microcomputer that can't be done by other means . . . (1978).

It is interesting to note, at this point, that at least some of the business concerns involved consider the services they plan to provide as something less than socially mandatory. In response to the Clyne Committee's recommendation that CATV be given "rate of return" status as a natural monopoly and public utility, the Canadian Cable Television Association argued, in part, that their service was a luxury, not a necessity. Presumably the same argument extends to the one-way, full "videotex" system that the Tamec Report (1979) urged be erected by the cable industry, to be paid for and made profitable by advertising revenue.

As a luxury item, the government is under no obligation -- moral or otherwise -- to ensure equity of access to videotex systems. Equity of availability must be based on something more than the theoretical "right to communicate".

However, while Infomart did close one advertisement with the breast-thumping declaration that "In short, Infomart is information," one would hope that it is not all information. Because, although there is nothing wrong with the type of information that would be provided by commercial databrokers, alone it is incomplete and amounts to a reprehensible betrayal of the enormous

potential of videotex. As Instant World (1971) recognized:

. . . if the storage and availability of valuable information is left entirely to private enterprise, a financial interest is likely to be created in that part of the information that has a realizable commercial value, while wide areas of socially valuable information may not be available at all. (p. 51)

Those neglected areas, although ignored as unprofitable by the commercial sector, are presumably precisely the areas that technology like Telidon should be conceived of to service. The report continued:

Virtually all the new applications of computer/communications integration expected to become available during the next few years, are likely to be oriented to business and industry or to protection of property. Some cynics would suggest that all the fine sounding social and personal benefits that are being predicted are no more than pie in the sky and, if developments are to be controlled only by market forces they may well prove to be right. (p. 168)

Further, those individuals who would most benefit from the use of videotex, particularly as an instrument of social welfare -- the elderly, the physically handicapped, the economically and geographically deprived -- would, under the dictates of pure market pressure, be the last people to be granted access to the system. In such a scheme, there may well be a ghost in the machine, but it is the ghost of unfettered capitalism and it does not have a conscience.

A socially responsible videotex system, on the other hand, would, in addition to the services offered by the commercial sphere, use the technology to provide services of marked social benefit. And it would ensure that these services be available to those for whom they would constitute a genuine improvement in quality of life. Such services would be responsive to basic social needs: health service, education, housing, employment.

"The projected increases in the number of elderly and late-middle-aged, together with the likelihood of scarce financial and material resources, only serve to enhance the current attractiveness of computers and telemedicine," the Science Council's study on the changing age structure in Canada (1976, p. 73) has noted. Moreover, as the Council pointed out earlier with regard to health services:

A suitably programmed computer, supplied with an adequate database, can provide:

- a guide toward the most effective way of arriving at a diagnosis;
- an objective check of the diagnostic methodology used by the physician;
- a means of preventing the physician's thinking from falling into familiar ruts, and thus overlooking unusual ailments;
- access to the most recent advances in a specialty;
- a means of keeping remote physicians in touch with their colleagues who contribute new experiences and ideas to the system;
- a means of giving a remote physician a rapid consultation in an emergency, such as a poison case;
- an untiring 24-hour a day service.

(Science Council of Canada 1974, p. 39)

To which the Science Council's Perceptions 2 report has added:

- An aged person with a poor memory will not have to recall treatments and drugs administered if receiving attention in a new environment.
- Diagnoses of rare diseases may be easier to make if it is possible to program them into the computer.
- Rapid retrieval of important epidemiological data will become easier and more precise. This may make it easier to detect localized environmental and occupational hazards. It should also become somewhat easier to identify age-specific health hazards and disease propensities and perhaps the impact of certain events (such as the closing of a lead plant, or the sudden introduction of asbestos into the water supply). This will enable treatment to reach more of the affected population.
- Information retrieval for health care professionals may be improved.
- It may be possible to reduce the need for clerical staff and thereby increase resources available directly for health care delivery.

(Science Council of Canada 1976, p. 74)

This is the type of use that a Telidon system could be put to that would make it, not merely a frivolous device or a gadget for the suburbs, but an important social tool. And in this context equity of access becomes a consequential concern. If it can be demonstrated that videotex is a powerful instrument in the improvement of medical care and services, it is paramount that the technology be distributed as widely and as quickly as possible and that the necessary databases be created and maintained: not because anyone concerned is going to make a profit, but simply because this is the type of service the individual demands of his government, and is entitled to receive. As the Science Council (1976) correctly asserted:



Surely making medical care more accessible is one of the justifications for telemedicine and therefore the technological innovations should proceed in tandem with programs designed to ensure that accessibility is not an empty phrase. (p. 75)

The same arguments apply to videotex use as an educational tool. It seems obvious that a videotex system would be admirably suited to instructional uses, both in formal and non-formal schooling. Students in rural areas, currently denied access to the educational resources of urban centres could, by means of a videotex terminal, be given the same instructional opportunities as their counterparts in metropolitan centres. A videotex course would have the advantage that the student could proceed according to his or her own speed. It could be programmed to stop and ask questions, proceeding when answered correctly, and correcting if answered incorrectly. Indeed, universities and schoolboards may find it to their economic advantage to assemble their own course databases, thereby reducing the costs of education and introducing common standards of education. The terminals could be used to retrain and re-educate adults who, in this lightspeed world, may have found their trades rendered obsolete by new technology -- perhaps even by videotex technology. The Science Council (1976) has noted that:

. . . it is apparent that the increased numbers of middle-aged, and the decreased numbers of university-aged people, will lead universities and other post-secondary institutions to seek other 'markets.' Since 'adult learners' will not typically be full-

time students in residence, it is probable that those institutions which most successfully increase their enrollments, will use sophisticated communications systems and perhaps, interactive computer terminals. (p. 77)

In addition, the videotex network could act as a socially cohesive force -- a channel by which Canadians could tell one another about themselves and their communities -- and in any number of socially favourable capacities difficult, at the moment, to anticipate. Part of the difficulty in imagining the videotex service potential stems from its technological versatility, permitting not only information retrieval from a central source, but decentralized networks, transactions and interactive point-to-point services. However, Guité (1977) managed to assemble a list of commercially less-than-popular information retrieval functions that would, nevertheless, be ideally suited to the new medium:

Employment information describing jobs and candidates for employment; consumer information about costs of food in several markets, about costs for renting apartments, borrowing money, getting TV sets repaired and the like; legal information about citizens' rights when signing contracts, when forcing retailers to meet guarantees on goods and services, or when seeking relief for divorce, family disputes and small claims courts; medical information for birth control and pregnancy, poison control, common ailments of children, the elderly and others would all rate highly. (p. 61)

He adds that new information systems could be effectively used to ". . . provide citizens with better access to information about government services of direct relevance to them." (p.65)

Further, such services (as well as those offered by the commercial sphere) would be of inestimable benefit to segments of society that cannot, without great difficulty, utilize present channels of acquiring information or performing mundane but necessary tasks. These would include deaf individuals, who currently cannot use either telephone or television, but for whom Telidon could replace many functions of the telephone and could subtitle their television programs; the elderly and the handicapped, many of whom are confined to their homes or institutions; and people whose homes are in areas remote from urban centres, and who do not have access to the range of information available to residents of metropoli. As the Science Council (1976) realized:

Communications technologies have the potential for reducing the need for physical mobility, for making available information and services, and for providing entertainment even to segments of the population with economic and physical disadvantages. These same groups will also benefit from the effects of data communications developments on medicine, transportation, finance, community development. (p. 79)

Hence, Telidon has the potential to be a powerful instrument for the social good and a responsible, conscientious government would not allow that potential to be wasted. If, indeed, commercial interests are unwilling or unable to take up the task of implementing such services, the responsibility should fall to the government to ensure that these services are provided. Indeed, it should be a prime consideration in erecting a videotex network. And once the databases have been assembled, it will be the attendant responsibility of the government to ensure that access to the system is distributed as widely as possible, particularly to those portions of the population who could most benefit from its use.

Such responsibility is not inconsistent with the government's own aims, as its Green Paper (1973) has stated:

. . . the Government is therefore concerned to ensure that the future communications environment foreshadowed by this huge range of new techniques and tools should not be allowed to develop without any regard for its impact on social and cultural values and the quality of life in Canada as well as on the Canadian economy. (p. 4)

English (1976), too, has realized that public policy (carried out through government intervention and subsidization) is required to replace usual competitive forces when the implementation of a socially beneficial strategy is an unprofitable undertaking for the industry alone. And the Science Council (1976) is also well aware that:

. . . bodies such as the CRTC will be of major importance in ensuring that access to communications technologies is available as broadly as possible, including, of course, to all age groups. (p. 75)

Assuring the availability of these non-commercial services will certainly cost a great deal of money, and the government -- just like the individual consumer contemplating buying a household terminal -- will have to weigh that cost against the perceived benefit. But where the individual is judging the benefit of a sole terminal to a single household, the government will be measuring the impact of an entire network on a whole society: a network that can give discreet birth control information to adol-



escents; that can teach French grammar to students in Red Deer, English grammar to students in St. Boniface, and the grammar of Fortran to both; that can bring groceries to the door of an elderly woman in the middle of a Montreal winter; and can ease the hardship of a paraplegic.

Nor, it must be emphasized, does assured access necessitate that the government place a subsidized screen in every living room. Rather, ensuring availability means that, in addition to the private terminals purchased by those with the means, public terminals be installed in post offices and manpower offices; in museums and libraries; in city halls of urban centres, and community halls of remote towns and villages; in nursing homes and convalescence wards. It means that the government subsidize the cost of terminals so that they can be made available to schools and colleges and hospitals. And, similarly, it means subsidized costs to allow installation of private terminals in the homes of the elderly, the infirm, and the physically handicapped.

Such a scheme -- involving the sale of private terminals to the general public, the installation of public terminals in public buildings, and the subsidization of units to be placed in institutions and in the homes of the disadvantaged -- circumvents the obvious limitations to access. The benefits of the system become immediately apparent to its users. The cost is defrayed by public funds. The time delay in extension of services is

avoided since a terminal can be placed in a Victoria library just as easily as one can be installed in an unemployment insurance office in Halifax. And the skills required for effective use of the system could be quickly acquired with the presence of units in schools, universities, and libraries, and the subsequent familiarity with the system.

Hence, as the public becomes acquainted with the operation and advantages of a videotex network, it also becomes increasingly disposed to use the system; more and more individuals may find themselves leaning toward the purchase of a home terminal, particularly since government support for volume production of public terminals will presumably bring the unit price down to an affordable few hundred dollars. And with decreased cost and the consequent increased penetration of the private, household market, it would, perhaps, be possible to institute further interactive services: a computer-assisted medical referral service, for example, whereby requests for medical information or aid (as in the case of a household accident, such as a child mistakenly swallowing poison) could be answered instantaneously via videotex. Enhanced videotex service of this type would amplify the benefits to the user, which, in turn, would no doubt promote even further penetration of the home market.

With this increased penetration would come even heavier use of the available commercial services, and correspondingly increased profits for the commercial database brokers. It might, therefore, be possible to amortize the cost of the public services by subsidization from the profitable (luxury) commercial services.

This entire scheme hinges on the hope, however, that there is a conscientious ghost in the machine: that Telidon will be seen to have enormous potential as a socially beneficial instrument, and that a decisive government will take the appropriate steps to ensure that this potential is not squandered.

#### Summary: A Recipe for Success

If the development of Canadian videotex systems is left to commercial interests alone, Telidon may emerge as little more than a labour saving gadget, since the realities of the pursuit of profit are unlikely to support the socially beneficial uses to which the technology is suited.

Government action is therefore required to ensure that these publicly advantageous functions are fulfilled, and to assure that the widest possible access is secured. This is accomplished by placing public terminals in libraries, museums, government offices and the like; by placing private terminals

at the disposal of the elderly and the handicapped; and by encouraging educational institutions to adopt usage of the system through subsidies.

A government-financed, volume production of terminals should result in a reduction in price of terminals which, in conjunction with public familiarity with the operation and benefits of the system, should lead to increased penetration of the household market. As more and more homes are plugged into the network, it may be possible to institute further services previously unfeasible with a system composed predominantly of public terminals. These added services would contribute to the perceived benefits of owning a private terminal and so further stimulate sales. The result would be heavier use of commercial services and hence increased profit for the commercial information providers. It might eventually be possible to defray the cost of the public services by subsidization from the profitable commercial services.

### 3. CONSTRAINTS ON THE VISION

*(There are no bugs in the system. But there are still bugs in The System)*

*. . . we would never use a hypothesis we believe to be false, nor a policy we believe to be wrong.*

*— Michael Polanyi, Personal Knowledge*

The chimera that has come from the merger of computer and communications technologies has two forms. In the videotex (interactive) mode, Telidon has the potential to provide a host of new in-home services, not unlike many of the possibilities envisioned by Instant World (1971). These include tele-shopping and -banking, computer-assisted learning, point-to-point messaging, pay-per-program TV, terminal-to-terminal shared visual work-space, automatic fire and burglar alarm reporting, remote utility meter reading, electronic videogames, home computing programs, and electronic library service.

The system can also operate in a teletext mode, restricted to information retrieval, or file selection from the broadcast of, for example, updated news, weather, sports, classified advertisements, yellow pages, real estate listings, entertainment, transportation schedules, consumer information and TV program subtitling.

The federal Department of Communications has congratulated itself on the fact that the Telidon system:



is compatible with virtually every mode of transmission in use now or in the foreseeable future. The system was designed to operate over telephone lines, cable TV, optical fibers, off-air broadcasting, satellite, packet-switching networks and microwave, as well as various combinations of these. (Telidon Today, p. 2)

The technological versatility of the system, however, may mask certain structural constraints related to equity of access. Furthermore, the technology itself is not usually considered a constraint to equity of access. (Parker 1976; Thompson 1976) Specifically, Thompson (1976) has alerted us to the importance of the "social and economic infrastructure supporting a system": the organization of inter-relationships between the ownership and financing of the system, the producers of content, the regulators, and the public. It is therefore essential to this analysis to identify all the actors and institutional arrangements characterizing the present stage of videotex development: existant or potential.

The sources of constraint to equity of user access identified in this analysis are based on a consideration of those obstacles that are likely to arise during the implementation of the proposed "socially responsible" scenario. The discussion is applicable, however, to any videotex infrastructure.

Interdependence Between User and Information Provider Access

The interactive nature of communications systems such as videotex legislates that sources of constraint to equity of access on either end of the transaction are interdependent. And this interdependence manifests itself importantly in the initial stages of system implementation:

. . . there can be no markets for Telidon unless there are databanks to which it can give access. Conversely, there will be few, if any, such databanks until it can be shown that Telidon can be manufactured and marketed at prices that will create a substantial demand. (Clyne 1979, p. 62)

and:

A medium that offers little or no economic opportunity to the people who create content will be empty and without exciting content, nobody will spend money on the equipment. (Thompson 1980, p. 26)

The cost of information provision, then, as well as the costs of users' terminals are both potential sources of constraint to the availability of videotex.

Although Teldion terminals now being produced by different manufacturers such as Norpak and Northern Telecom are already commercially available, the unit prices are still prohibitively high to have reached "market readiness", according to one news

report. (Gazette, January 14, 1981)

One strategy that LINK (1981) has proposed for Canadian suppliers is to produce information provider equipment at such reasonable costs that the increasing number of databases made available would provide incentives to promote an installed base of user terminals by those who want to sell information.

Recently, DOC's Telidon Program initiated a 10.5 million dollar Industry Investment Stimulation Program (IISP) which will subsidize the purchase of up to half the number of terminals required of eligible organizations for operational systems or market trials. The IISP, as described in a request for proposals (DOC, 1981), is expected to

encourage Teldion database content creation, not only by reducing equipment costs, but especially by expanding the potential audience. (p.2)

Strategies of this nature are recommended for the initial stages of videotex development for, as Beigie argues (1973), industry might postpone potential new services beyond the time that public interest dictates while waiting for specific customer demands to arise:

. . . it is impossible to estimate demand for new telecommunications services solely on the basis of past experience. Technological advance has opened up whole new dimensions in the role of telecommunications, and once users have had a chance to experiment with facilities having greater capacity and increased flexibility, wide ranging repercussions on traditional working, shopping, entertainment, and other aspects of day-to-day life will undoubtedly develop . . . usage patterns will emerge only after facilities are in place. (p. 65)

To escape the circularity of a situation where constraints inherent in the interdependence of the costs of information provision and user demand arrest the development of the availability of videotex, some form of government intervention in the form of incentives or subsidies may be appropriate. The purposeful development of public service databases in combination with the subsidization of public user terminals, as suggested by the scenario developed earlier, is still another strategy designed to alleviate this constraint to implementation.

#### Content-Carrier Separation: Toll Booths on the Electronic Highway

The notion of the interdependence of constraints to access at both ends of the videotex transaction has even further ramifications for the structure of the industry. It implies that if the system is designed to meet the objective of equity of user access, then it must necessarily ensure equitable access to information providers.

Carrier control over content is construed as a constraint to equitable user access for the simple reason that those who control both the content of an information system and its sole or dominant mode of carriage are in a position to control the utility of the system for different sectors of society. "People don't pay money or devote time to products that represent mere technology push. They do these things when they perceive utility or usefulness in the products or services." (Thompson 1980, p.26) This consideration has important implications for the extension of services beyond the most profitable markets. If carriers were in a position to determine what information and services were available via videotex, then, steered by the brute force of the profit motive, they might be inclined to restrict services to those attractive primarily to corporate markets. And although common carriers might be legally compelled to extend services on demand for all who would be willing to pay, the possibility exists that those services (if contrary to the carrier's interests) might be structured and developed so that demand would evaporate.

Equity of user access also requires the creation of high "utility" databases -- that is, databases that consumers would perceive as particularly useful --; however, competition of the carrier with its information-providing customers may constitute not only an unfair competitive advantage but stifle opportunity for innovation in the computer service industry, innovation that could

create public demand for a widely distributed system. The transmission facilities must therefore be governed by a principle of "open access", according to Parkhill (1979) who identifies three conditions that are basic to any open-access policy:

- 1) a total ban on any carrier involvement with content;
- 2) an obligation on the part of the carrier to meet any reasonable demands for the service;
- 3) a legal requirement on the part of the carrier to distribute the services of all suppliers on a non-discriminatory basis at authorized tariffs. (p.72)

The Clyne Committee Report, Telecommunications and Canada, (1979) recommended that non-programming services could be offered by CATV through arm's length subsidiaries respecting the content-carrier distinction. Others have been, and justifiably so, more wary of the arm's length subsidiary solution for the provision of computer-communications services. (Babe 1975; Ouimet 1979)

Suppose an arm's length subsidiary offering competitive videotex services took a loss on these services in order to lower prices and eliminate competition; then its parent, carrier corporation proceeded to raise basic videotex transmission rates in order to recoup a fair rate of return for its shareholders. Not only would users and information providers be charged more in terms of subscriptions, introducing cost constraints to equity of access



but both would be denied equitable access in terms of the ability of users to express preferences for certain services. By engaging in unfair competitive practices, the carrier is in a position to control what is available over videotex.

If traditional rate-of-return regulation is insufficient to deal with the potential threat of the arm's length subsidiary solution to equity of user access to videotex, more effective methods of regulating the videotex industry may have to be devised if carriers are to be involved in the creation or packaging of videotex software. Pseudosolutions to content-carrier separation merely breed variations of a continuing problem.

#### Videotex Transmission Facilities: Who Delivers Videotex Services?

Telidon offers the technical possibility of several different types of terminal-database common carrier connection. The system is compatible with at least three major existing delivery systems:

- (a) television broadcasting,
- (b) cable, and
- (c) telephone,

and at least four new media:

- (d) two-way cable,
- (e) hybrid systems,
- (f) optical fibre, and
- (g) satellites.

However, none of the major existing delivery systems in isolation can provide all the potential services envisioned by the creators of Telidon. In fact, the switched telephone system is the only existing delivery system that is compatible with services in the interactive

(videotex) mode, excluding only television services. (Parkhill 1979)

Parkhill presents three possible alternative videotex delivery systems, only one of which requires an integration of existing systems; that is, "hybrid" networks which combine the switched telephone system with full-channel broadcast systems. Two-way cable is another delivery alternative, which, like the "hybrid" network concept, is capable of all the service functions of the existing telephone transmission facilities as well as television services such as pay-per-program TV. And the eventual result of the development of optical fiber networks could be the full integration of television broadcasting and information distribution systems into a wide-band common carrier network. (Parkhill 1979)

No government policies resolving the issue of who will deliver videotex services have yet been formulated, despite the recent CRTC (1980) decision to open "non-broadcasting" services, at least experimentally or provisionally, to competition among cable operators and telecommunication carriers. And, given the surrounding motives of equitable access, the appropriateness of the seven possible modes of delivery would have to be judged on the basis of the following criteria:

i. Cost to User:

The cost of transmission will unavoidably affect the availability of the system to different sectors of the population according to income and geographical location. Public demand will depend to some extent on the subscription rates and long-distance rates (if applicable) charged. The costs for extending services

should not be ignored, since they might well result in lengthy delays before the system is available to users in remote regions; or, alternatively, lead to prohibitive user costs in such regions.

ii. Extension of Services:

Is the delivery system proposed technically capable of serving all potential users of videotex in an economically efficient manner and without undue delay? If legislators decide to provide services they deem "essential" and subsidization of service to remote locations becomes necessary, can the services be smoothly implemented? A certain amount of foresight in the planning of videotex services is evidently required.

iii. Flexibility of Service Delivery Mode:

Public demand for videotex will not only depend on the cost of the system but on its cost with respect to its perceived utility over existing systems. (Thompson 1980) It appears that a mode capable of the most diverse service offerings and with optimal flexibility is in a better position to generate the most significant demand. It can be reasonably expected that a user will try to determine whether the cost of videotex transmission justifies its utility over the potentially less expensive teletext mode, or whether either justifies marginal utility over existing media and systems.

A most important consideration is whether the potential teletext service is technically capable to meet the minimal standards devised to accommodate future social service objectives envisioned by the planners of an equitably available system. Although it appears that Telidon will be the standard videotex coding scheme adopted in Canada (Leduc 1980), no official standards have yet been set for the mode of its delivery. When this is accomplished, the question of who will deliver videotex may become more manageable. It is in the interest of users, that policy-makers should give priority to the development of a system designed to meet the service requirements relative to important social objectives.

The Science Council Committee on Communications and Computers (SCC 1979) recommended a scenario for the orderly implementation of videotex. It is expected that a Policy Paper designating the main actors in the system and standards for the system will eventually be drawn up. In the interest of equity of availability of videotex to users, the following would be important concerns:

- 1) that videotex delivery mode standards are specified, in part at least, on the basis of the social service objectives of the system; and that
- 2) decisions concerning the role of different transmission systems in videotex delivery be made in accordance with a plan for equity of availability, in turn based on information which is relevant to potential constraints to user access associated with

transmission. These would demand a consideration of the following variables:

- 1) the cost to the user;
- 2) the time delay for extension of services; and
- 3) the versatility of the delivery mode.

The inability or the unwillingness of policy makers to consider the appropriateness of certain delivery systems in terms of the three criteria discussed above would constitute a constraint to equity of availability of videotex to users. Hence, each delivery candidate should be examined in turn, and its respective suitability evaluated:

a) Television Broadcasting

Although dedicating a full channel to the broadcast of teletext would endow this medium with greater capacity, the scarcity of the airwaves makes it more feasible to use the vertical blanking interval. The latter option restricts the number of pages to 150, however, as opposed to 10,000 available over a full television channel. (Parkhill 1979) TV Ontario (OECA), a public TV network funded by the Ontario government, and the CBC are the only broadcasting organizations in Canada to announce a teletext trial. Educational information and courses are presently being offered in the OECA trial. Owing to the limited capacity, it is extremely unlikely that broadcasting operations could ever be considered to play a predominant role as transmitters of the multi-service system envisioned.

b) Cable

One-way cable facilities service fifty-seven percent of Canadian households. Although they have more programming channels at their disposal than the television broadcasters, existing coaxial cable distribution facilities still provide essentially information-retrieval-type services. Again it must be mentioned that no clear-cut decisions on the role of cable in videotex development can be made until standards for the delivery of medical and educational services, for example, are decided.

Despite the fact that cable companies have expressed a great interest in diversifying into Telidon broadband services, cable penetration has not reached the near-ubiquitous levels of conventional broadcasting and telephone networks. The economic ramifications of the expense involved in extending service to the last 40 percent of the population should be considered seriously in the context of a plan for implementing an equitably available system.

c) Telephone

The switched telephone system is the only existing delivery system capable of offering the interactive services of videotex. Its 98% penetration of Canadian households and "no limit" on the number of pages available give it several advantages in terms of the economics of extension of services and flexibility in the amount of information that could be made available over the system. Unfortunately it is currently unable to provide analog TV frames, except over the Local Broadband Network which serves only the largest cities in Canada. If it is determined that certain



"essential" services require such a capability, then some kind of arrangement between the cable companies and telephone companies may have to be made.

d) Two-way cable

The cost of converting existing systems into two-way systems can be avoided through the acquisition of more affordable teletext generation equipment, offering low-cost entry into the information business (LINK 1981), but again this implies a choice between videotex and teletext, a less adequate mode than the former. Just how less adequate remains to be determined as decisions concerning the standards for services designated socially advantageous are yet to be decided.

Even though some authors (Godfrey, Ouimet) would agree that cable companies are committed to the profitable expansion of one-way services, at least one cable company, Télécâble Vidéotron, will use packet-switching and multiplexing to offer full interactive services to a Montreal suburb. Rogers Cablesystems are currently developing a multiplexed packet data network for two-way transmission. The advantages over typical telephone circuits include increased speed, lower error rate, and reduced facility costs because cable based systems do not require modems and ports for each user. It is also a less expensive option than a second telephone line. (Lind, 1981)

e) Hybrid Systems

Cable companies could be spared the high cost of two-way modification by providing the response to user requests made over telephone lines. (Parkhill 1979) Such a system might also be economically attractive to the telephone companies in terms of reducing the local exchange load. (Parkhill 1979) However as Parkhill notes, the exchange load problem will diminish as digital systems evolve, and the cost of technological devices to achieve such an integration might be quite high.

For the provinces whose telephone companies own the cable plant -- Manitoba and Saskatchewan (Leduc 1980), it could be expected that such integration could be more easily effected. A field trial in Winnipeg conducted by Manitoba Telephone will make use of cable and telephone lines to offer videotex. (Leduc 1980) Bell Canada, however, favors its own integrated plant concept, whereby it provides " . . . the transmission facilities for all organizations within its operating territory, including cable companies." (Leduc 1980, p. 14) Although cable companies might reasonably be expected to oppose such proposals, Leduc (1980) maintains that certain customer advantages are apparent:

This approach is an economical way of providing transmission and guarantees quality transmission. Coordinated planning is possible, non-duplication of facilities reduces capital expenditure, and maximum use of the facilities would lower the cost of providing and receiving services. In a country with

a small population geographically dispersed over a large territory, this approach makes economic sense.  
(p. 14)

f) Optical Fibre

Switched optical fibre networks offers perhaps the most flexible array of possible services by introducing a sufficient number of television and information channels, thereby precluding the separation of television broadcasting and information distribution systems. (Parkhill 1979). Madden (1979) forecasted comparability in the cost of optical fibre and telephone twisted copper pair by the early 1980s, and the economic feasibility of replacing cable and telephone wiring to the home by the mid-1980s. Other speculations are more conservative, however: 1985 and 1990, respectively.

(Clyne 1979) Nevertheless, the Clyne Committee itself recognized:

It cannot be denied that there would be economies if all local access were provided through unitary connections, but that is not to say that immediate action is necessary or even desirable to force the installation of integrated plant at a pace that is not dictated by practical considerations now or in the possible future.  
(p. 26)

It recommended that the pace and extent of plant integration be determined by future technological, economic, and social considerations.

g) Satellites

Telecommunications satellites are already providing access to the telephone network, and their importance in providing broadcasting to the 2 per cent of the Canadian population who are under-served or not served at all by off-air modes of delivery has been recognized. (Clyne 1979) About 98 per cent coverage seems to be the economic limit of traditional telecommunications, and the significance of the role of satellite communications for the benefit of those thousands who can be considered deprived in this respect (Clyne 1979) should be considered by the planners of videotex in Canada.

The transmission facilities used to deliver videotex services will necessarily affect the cost to the user and the extent and type of service availability. Some decision must be made as to the appropriateness of the teletext mode in the provision of "essential" services, as well as the videotex mode without the capacity for a certain number of analog TV frames. Users must have access to transmission facilities capable of supplying "essential" services, and both social and economic considerations in meeting the demands for extension of services should form the basis for an assessment of the delivery system alternatives presented.

### Competition Among Transmission Facilities

Both TCTS (Trans Canada Telephone System), a consortium of eight of the nation's largest telephone companies, and CN/CP Telecommunications offer essentially equivalent private line services, electronic messaging, access to databanks and data-processing facilities serving the same areas. Under the competitive duopoly arrangements, it should be noted that neither is required to extend these services further than their most profitable limits. The recent CRTC (1980) decision to allow non-programming services to be opened to competition among cable and telecommunications carriers under the present circumstances, makes it unclear how such a policy would ensure the extension of videotex service beyond the major urban markets. Services and transmission facilities are bound to overlap in profitable areas.

Since the FCC began to authorize competitive communication systems in the late 1960s, alternative networks have linked major U.S. cities. Fifty-five percent of Bell's telephone revenues come from business customers and slow growth of new services in other less profitable markets is expected. Without rate averaging procedures, it is unlikely that cross-subsidization from the larger business users to the smaller users will take place, and for all these reasons Jacobson (1979) predicts future inequities in access to, and distribution of information services.

According to English (1973) public policy (carried out through government intervention and subsidization) is required to replace usual competitive forces when the implementation of a socially beneficial strategy is a relatively unprofitable undertaking for the industry. The appropriateness of competition among transmission facilities will necessarily depend on a determination of whether or not the extension of services beyond certain limits is indeed unprofitable. Exactly what costs are involved in extending services beyond urban limits? According to Beigie (1973):

. . . the pricing structure [in telecommunications] is differentiated on the basis of such factors as the number of telephones that can be reached in a local exchange, the time and distance of a toll call, and the class of service (business or residence) that is provided. To relate these factors in an overall framework, there has been a universal adoption in Canada of a 'value-of-service' system of pricing, but the definition of 'value' and the specification of a functional relationship between value and price have been determined by arbitrary rules of thumb. Although standard definitions of value of service pricing appear to rely exclusively upon demand considerations, most of the price relationships have at least a partial cost justification. But in the absence of reasonably precise cost estimates, neither we as independent researchers nor regulators as agencies of public control are able to reach conclusions as to whether price differentials are greater than, less than, or equal to cost differentials. The answer to this type of question is of fundamental importance in evaluating carriers' performance in relation to policy objectives.

Traditional reasons for protecting monopolies like telephone companies from competition is to ensure economies of scale and cross-subsidization from the more profitable to less profitable sectors to ensure extension of service at reasonable rates. Their monopoly status



allows this to be technically and economically feasible:

Should more than one firm operate in such an industry, total costs of supplying a given level of output will be above the minimum attainable amount . . . (Beigie 1973, p. 59)

Assuming this perspective, Godfrey (1979) maintains:

The one simple rule that will help insure proper economies for the consumer is that all these services should come into the home or business with an absolute minimum of duplication. (p. 124)

However, competition among transmission facilities constitutes a constraint to the availability of videotex to users only when it does in fact cost a lot more to serve a person in a remote location than one in an urban centre. Extension of service beyond urban and business districts, in this case, would not be a viable economic pursuit under competitive conditions. Only when phrases like "insofar as technically and economically feasible" can be removed from obligations for carriers to meet demands for service at reasonable rates, can a competitive structure in the transmission industry be considered seriously.

If the extension of services can be ensured, there may, in fact, be real advantages to competition. As McCrum and Ryan (1981) have argued:

Institutional and regulatory considerations can have significant impact on the risks and benefits of new forms of data communications. It is by no means obvious, for example, that a regulated monopolistic environment for provision of data communications will

result in lower cost or better service to the end user than an open competitive environment. The arguments relating to cost advantages of broad-based sharing of resources can be negated by removal of normal competitive incentives to keep prices down. (p. 38)

Since, however, the cost, diversity and availability of videotex services have all been identified as factors affecting access, no simple regulatory solution to the access issue, optimally satisfying all three conditions, is immediately apparent.

#### Fine-Tuning the Infrastructure

Whatever alternatives are adopted for the videotex transmission industry, the structure should be one that facilitates the implementation of a system dedicated to the objective of equitable access. According to Babe (1975):

... if social policy is to be carried out through the instrument of private enterprise, the incentives must be structured in such a way that the firms find it to be in their economic interest to pursue such goals. (p.79)

In order to meet the social policy objectives of videotex, carriers would have to find it in their economic interest to extend services at reasonable rates, divest control over content, and allow access to information service providers without discrimination. If any of these conditions are not met, difficulties will be encountered in attempts to ensure equity of availability of videotex to users. There are no immediately obvious overall solutions

to alleviate the constraints to user access identified.

Designating the industry a regulated monopoly, for example, does not necessarily ensure equitable access. As Beigie (1973) notes:

On the one hand the structure of the telecommunication industry is such that we cannot assume . . . that the self-interests of carriers coincide with those of the public at large. Since the number of different service qualities is increasing so rapidly in telecommunications, on the other hand, traditional forms of regulation have difficulty ensuring that service goals are achieved. There is an important need to search for new ways to avoid or reconcile potential conflicts through a combination of increasing the role of the profit motive and increasing the sophistication of regulatory action. (p. 138)

That is not to say, however, that decisive government action in the form of coordinated policies, regulations, incentives and subsidies cannot have an effective role in optimizing the structure of the industry with a view to facilitating the achievement of a socially responsible and equitably accessible videotex system.

#### 4. SUMMARY

The technological fix is in. In itself, it cannot guarantee that videotex will develop as a powerful social tool, enhancing our basic needs and wants, such as health service and educational opportunities. Indeed, if the system is left to the blind, buffeting pressure of the corporate arena, in all likelihood it will emerge as a super-charged gadget, a tantalizing, mesmerizing toy on the order of a videodisc player. (The videodisc technology is not a flippant example; while videodiscs have the potential to be employed as enormously useful educational instruments, the technological leisure society has seized on them as merely another technological leisure, a frivolous device for the well-to-do home.) To talk about equitable access in such a context is ludicrous. It would be just as useful to talk about equity in the availability of microwave ovens.

Hence, to ensure that the potential of videotex is not wasted, it will require decisive, perspicacious and socially responsible government action -- first, to promote the creation of the appropriate databases and second, to secure the necessary availability of access to those databases. This can be accomplished by the installation of public terminals in suitable public locations, and the subsidization of terminal costs for educational institutions and for the socially disadvantaged (e.g. the elderly and the handicapped).

The ensured volume production of terminals that this involves should bring the unit price down to a generally affordable level, and this, combined with public familiarity with the system, should lead to increased purchase of private terminals. As household penetration increases, it may be possible to institute sophisticated public interactive services -- emergency medical services, for example -- that would heighten the attractiveness of the system and so, in turn, lead to greater sales of terminals.

Implied in this decisive government action is a clear delineation of the content-carrier distinction, divesting the carrier of any control over content; a reasoned choice of transmission facilities in terms of widespread delivery capabilities, capacity for interactive services, economy, and the like; and an overall designation of the legitimate roles of the various actors currently jockeying for position and vying for attention on the videotex stage. Halting or tentative government action can only lead to disorder and the messy implementation of what promises to be one of the most important technological devices to make its way out of the research laboratory.

Peering into an opaque future is at best a risky business. But one thing, at least, is clear: the proper implementation of videotex services in Canada demands government action, overview and collaboration with industry and other affected sectors.

## 5. AFTERTHOUGHT

*(Concorde, after all, flies a lot of empty seats across the Atlantic in half the time it takes a 747 to ferry its cargo of passengers)*

Much has been made during the course of this discussion of the vast and varied uses to which a videotex system could be put. The sheer enormity of Telidon's potential can be expected to fuel old, familiar arguments maintaining that the device will simply increase the lacuna separating the information-rich from the information-poor.

Well, perhaps. But to resist the existence of an "information elite" is to foist a hopelessly impossible egalitarian ideal on a reality that will have none of it. "True education," realized Felix E. Schelling in Pedagogically Speaking, "makes for inequality; . . . for inequality, not mediocrity, individual superiority, not standardization, is the measure of the progress of the world."

Nevertheless, it must also be stressed that widespread deployment of the videotex network envisioned in this paper would make possible a whole range of new activities, even among the "information poor." And this, too, is the character of education. As the cook of Alice Freeman Palmer -- president of Wellesley College -- remarked when the lady marched into the kitchen and, without any previous experience, baked a loaf of bread: "That's what education means -- to be able to do what you've never done before!"



However, this entire discussion -- and all the prognostications, suppositions, and policy recommendations accompanying the development of Telidon -- must be tempered by the admission that despite the research, the money, and all the legitimate hopes, it is just possible that, for any number of reasons, videotex will simply fail to develop. After all, the years of effort and combined expertise of Anglo-French aeronautical engineers haven't been enough to fill the cabins of Concorde. Gordon Thompson (1980) warns that the mass of rhetoric surrounding the arrival of videotex is disturbingly reminiscent of the furor that preceded the non-arrival of the comet Kahoutek and with the huge information-wielding capacity of Telidon in mind, it may also be useful to remember Seneca's (54 B.C.-A.D. 39) admonition, "Since you cannot read all the books which you may possess, it is enough to possess only as many books as you can read."

Telidon would not be the first white elephant to be crushed to death by the pressure of technological overkill but with responsible and timely attention on the part of the disseminators (industry), regulators (government) and users (educational institutions, public), we are optimistic that this will not happen.

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